

CLAIMS

1. Method for handling a tubular knitted article comprising a first open end defining an elastic edge, a second open end surrounded by a band and which must be closed to form a closed toe of the article, along a closing
5 line having specific orientation with respect to a pocket of fabric of the article;
characterized by the steps of:

- stretching said article over a tubular member so that an intermediate part of the band surrounding said second end is positioned along a line intersecting in two points the end edge of the tubular member and the
10 remaining part is disposed along the outer side surface of the tubular member;
- detecting the angular position of said band on the tubular member;
- identifying the position of the pocket of fabric on the basis of the angular position of said band with respect to the tubular member.

15 2. Method as claimed in claim 1, characterized by the steps of:

- determining the angular positions of two portions of said band adjacent to the end edge of the tubular member and disposed on the outer side surface of said tubular member;
- identifying the angular position of the pocket of fabric in the intermediate
20 area between said two angular positions.

3. Method as claimed in claim 2, characterized in that said tubular member is made to rotate about the axis thereof and the angular positions of said two portions of the band are determined during said rotation.

4. Method as claimed in one or more of the previous claims, characterized in that said tubular member has a circular section and in that said intermediate portion of the band surrounding the second end of the article is disposed along a chord of the circumference defined by the end edge of the
25 tubular member.

5. Method as claimed in one or more of the previous claims, characterized in that the position of said band is detected by means of an optical
30 detection system.

6. Method as claimed in one or more of the previous claims, characterized in that the tubular member is disposed in an angular position defined as a function of the position of the pocket of fabric, the tubular article being

picked up by the tubular member when said tubular member has reached said specific angular position.

7. Method as claimed in one or more of the previous claims, characterized by the steps of:

- 5 - arranging at least a first sensor at a first distance from the end edge of the tubular member;
- rotating said tubular member and said first sensor with respect to each other about the axis of the tubular member with the tubular article inserted over the tubular member, until two portions of said band pass in
10 front of said first sensor, determining the angular positions of said two portions on the tubular member;
- identifying the angular position of the pocket of fabric in the intermediate angular position between the two angular positions of said two portions of said band.

15 8. Method as claimed in claim 7, characterized by: arranging a second sensor at a second distance from the end edge of the tubular member; and discerning between two possible diametrically opposed angular positions of said pocket of fabric using the combined detection of said two sensors.

20 9. Method as claimed in one or more of the previous claims, characterized in that said band surrounding the opening of the second end of the article is of a different color to the color of the fabric adjacent to said band.

10. Method as claimed in one or more of the previous claims, characterized in that the beginning and end of the fabric surrounding the tubular member is detected at the terminal end of said tubular member.

25 11. Method as claimed in one or more of the previous claims, characterized in that the angular position of said band is detected by means of at least one distance sensor.

30 12. Method as claimed in one or more of claims 1 to 10, characterized in that the angular position of said band is detected by means of at least one electrical contact cooperating with said tubular member.

13. Method as claimed in one or more of the previous claims, characterized in that a plurality of sensors are disposed around the axis of said tubular member, in proximity to said end edge of the tubular member, and in that said sensors and said tubular member are rotated reciprocally about the

axis of the tubular member, to determine the angular position of the band of the article on the tubular member.

14. Method as claimed in claim 13, characterized by the steps of:

- activating said sensors;
- 5 ➤ identifying the sensors closest to the band of the article and facing an area of the tubular member covered by the fabric of the article;
- using at least one of said sensors closest to the band of the article, to determine the angular position of the band on the tubular member with a movement of reciprocal rotation between the tubular member and
- 10 said sensors about the axis of the tubular member.

15. Method as claimed in one or more of the previous claims, characterized in that the tubular member is rotated together with the article to take said pocket of fabric to a predetermined angular position and in that the tubular member is rotated with respect to the article to take said tubular member to

15 a predetermined angular position, with the pocket in a predetermined position with respect to the tubular member.

16. A device for handling tubular knitted articles, comprising: a tubular member; means to insert a tubular knitted article over the outside of said tubular member; tensioning members to tension said tubular article inserted

20 over said tubular member; means for angular orientation of the article; a control unit to control the operations of said device, characterized in that said control unit is programmed to implement, by means of said device, a method as claimed in one or more of claims 1 to 15.

17. A device for angular orientation of tubular knitted articles, comprising: a tubular member; means to insert and stretch a tubular knitted article over the outside of said tubular member; a control unit; characterized in that it comprises at least one sensor positionable to the side of said tubular member in proximity to an end edge and capable of recognizing the fabric of the tubular article; an actuator to reciprocally rotate the tubular member and said at

25 least one sensor about the axis of the tubular member; said control unit being programmed to determine the angular position of the tubular article on the basis of the signal of said sensor.

18. Device as claimed in claim 17, characterized in that said at least one sensor is an optical sensor.

19. Device as claimed in claim 17, characterized in that said at least one sensor is a distance sensor.

20. Device as claimed in claim 17, characterized in that said at least one sensor comprises an electrical contact cooperating with the tubular member, said tubular member being produced in electrically conductive material, said tubular member and said sensor being disposed in an electric circuit, the contact between the sensor and the tubular member closing said electric circuit to produce a signal.

21. Device as claimed in on or more of claims 17 to 20, characterized by a plurality of sensors positionable about the axis of the tubular member.

22. Device as claimed in claim 21, characterized in that said sensors are disposed on a plane essentially orthogonal to the axis of the tubular member.

23. Device as claimed in claim 21 or 22, characterized in that said control unit is programmed to perform the following steps:

- activate said sensors;
- identify the two sensors closest to the band of the article inserted over the tubular member and disposed in positions in which the tubular member is covered by the fabric of the article;
- use at least one of said two sensors to identify the angular position of the tubular article.

24. Device as claimed in one or more of claims 16 to 23, characterized in that it comprises an element to clamp the band surrounding the toe of the article, to prevent said band from being positioned entirely along the side surface of the tubular member before detection of the toe pocket.

25. Device as claimed in one or more of claims 17 to 24, characterized in that said at least one sensor is carried by a support coaxial to the tubular member, said support and said tubular member being rotatable with respect to each other, and in that disposed on said support is an engaging member of the tubular article, operable to engage the tubular article and cause rotation thereof with respect to the tubular member when the support and the tubular member rotate with respect to each other.

26. Device as claimed in one or more of claims 16 to 24, character-

ized by an engaging member of the tubular article, to hold the tubular article in a predetermined position while the tubular member rotates therewithin, or to rotate the tubular article about the tubular member, holding the latter still.

27. Device as claimed in claim 26, characterized in that it comprises
5 at least two stations, said sensor(s) being disposed in a first station and said engaging member of the tubular article being disposed in a second station.